INDUSTRIAL ART

FINE ART BRONZES.

THIS is the time of the year when the wharves of the transatlantic steamboat lines are crowded with heavy cases of art goods fresh from the other side of the ocean, and dealers are busy unpacking their importations, which presently will fill their show-rooms until the anxiously-expected customer comes along and helps to disseminate the treasures through the country.

Among the long list of articles which we receive from France, none perhaps are of greater importance as works of art than the bronzes she sends us. Although the growing taste for ceramic ornaments has doubtless had some influence on the trade, yet a good bronze will hold its own; for, like a good painting, it will always have an individual value which the caprices of fashion cannot impair.

Paris and its neighborhood contain the most famous and the most successful bronze foundries in the world, and any one who has visited that city must have noticed the number of shops devoted to the sale of the smaller articles of vertu, and the beauty and elegance of their contents. The permission to view the works from whence these objects issue is only obtained with considerable difficulty, and the greatest jealousy exists between the masters as to obtaining the services of skilled and artistic workmen, upon whom principally the fame and success of the foundry depend. M. Collas, having improved upon certain old and well-known principles, and perfected a beautiful machine for the automatic reduction or enlargement of solid forms, was enabled to reproduce any bronze to any scale, with perfect accuracy and small cost. Such an invention well deserved the grand medal it obtained at the Paris Exhibition, and is now largely employed by French bronze manufacturers, who can by its means provide their customers with copies of nearly any famous work of art at a comparatively small cost. In the foundry, if the works generally to be produced are small in size, the moulding is done on benches, and the moulders work vis-a-vis at the same bench, which is divided by a longitudinal partition, provided with a shelf for tools. Small and unimportant pieces may be moulded in green sand, large works in loam, but the greater portion of general work is moulded in dry sand. The sand principally employed is obtained from a place called Fontenay-des-Roses, near Paris, and is damped and sifted. The moulding-boxes are of cast-iron, accurately fitted, the edges being planed true. When the objects are to be finished in the lathe, the patterns are sometimes of wood, but most frequently bronze models are made and are truly finished to the desired form. Many other substances are used for models, such as plaster, wax, fusible metal, porcelain, and glass. For facing sand, potato starch or fine white flour is used. Sand cores are used for all hollow pieces, unless these are to be cast in loam, or are of a large size; in the latter cases the cores are of loam. In bronze statue casting, the thickness of the metal should be as nearly uniform as possible, otherwise work will be distorted from unequal contraction; bronze contracts considerably on cooling—the extent depends upon the proportions of the constituent metals employed in its composition, and varies from 1 to 2 per cent. This contraction is found to increase in ratios with the size of the casting. The perfection of bronze work is said to consist in having the mould very highly finished, and obtaining a bright, sharp casting, which shall require only a minimum amount of subsequent chasing and tool work, thus leaving the skin of the casting as far as possible undisturbed.

In the French fine-art work the furnace arrangements are such that the moulds and cores are generally dried in furnaces heated by the waste heat from the crucible furnaces. The bronze is melted in clay crucibles, holding between 60 and 70 pounds, with coke for fuel and a fan-blast. For large work an air-furnace is generally employed. Best English or Straits tin and very pure North American copper, which latter is purified by liquidation, are the metals employed. A proportion of gates and runners may be added, but this is only done when the proportions and quality of their ingredients are known, and no old bronze guns, old copper or brass, or other material of unknown and variable composition, are ever used, as it is considered impossible to rely upon obtaining a first-rate casting from such uncertain ingredients. The moulds are arranged in cast-iron boxes, which are placed in a naked pit. A reservoir formed of sand with a charcoal facing is employed, into which the contents of the crucibles or air-furnaces are drawn. This reservoir communicates with the main gate of the mould, and as soon as a sufficient quantity of metal is in the reservoir an iron plug in the bottom is removed and the metal flows into the mould, from whence the surplus passes off by "rising heads," which are purposely kept small for fear of distorting the casting from too great a pressure. The gas evolved during the pouring is fired at the rising heads by a torch. Bronzes which are intended to be coated with enamel have their surfaces specially prepared for its reception by what the French artists call cloisonné, or partition work. This process is a somewhat tedious one, and requires great skill on the part of the moulder. The outlines of the design for the enamel are described by small thin partitions of bronze projecting upwards from the main body of the work less than a twenty-fifth part of an inch. Thus the bronze has its surface covered with a network of fine lines, and when the enamel is baked into the shallow cells so formed, the enamel and the bronze partitions are ground and polished to a uniform depth. These partitions serve two useful purposes—they describe the outlines, and they tend to hold the enamel firmly in position. In finishing patterns for this class of work every irregularity in the cells and partition walls has to be cut out, and great care is necessary not to injure the surface. When such patterns are finished they represent a considerable value in skilled labor, and are extremely delicate, consequently they are kept covered up on soft cushions, away from danger of accidental damage.

The founding of statues is certainly a very ancient branch of the art, and one in which our ancestors held their own, as the grace and skill of existing specimens abundantly testify. The invention of the Samian artist consisted in all probability of running the metal into a mould which contained a centre-piece or kernel, to diminish the thickness of the metal by leaving a hollow space in the centre of the statue. The necessity for this kernel is self-evident, for a solid bronze statue would be most costly and cumbersome. Besides, unless the statue is very light, it would in many cases be unable to stand. A rearing horse, for instance, could never be upheld by its hind legs if the whole body was composed of solid metal; and to lessen the weight that would otherwise bend and break so slender a support it is not only necessary that the horse should be hollow, but it must be as light as skilled workmanship can render it. Since the day, therefore, of the Samian artists down to the present day it has been the constant effort of bronze moulders to lessen the thickness of their statues by increasing the size of the kernel, so as to leave as small a margin as possible for the metal to run down this centre-piece and the mould with which it is enveloped.

Among early methods for obtaining this end, the most familiar is known as the cire-perdu, or waste-wax process, which was still in vogue when the present system was introduced, and the comparison between the two will best illustrate the progress now accomplished. The "cire-perdu" process required great care, and could only be carried out effectively by the sculptor or modeller himself. Thus let us suppose, for the sake of simplicity, that the object to be reduced is a portrait bust measuring 4 inches in height and 3 inches in width. The first step would be to model in "sand," or a mixture of porous cement, the outline of the bust, taking care to make it on every side ¼ inch smaller than the size it was designed to give to the finished statuette. This outline, or "core," must be coated up with wax to make up the deficient ¼ inch. This much might be accomplished by an ordinary workman, but for the rest the services of the artist are indispensable. With great delicacy of touch he must work up the likeness and texture of his subject on the wax; in fact, the expression, the minute lines, all the details of the artist's conception, must be executed in this wax, and it will be seen at once that he alone is competent to carry this out satisfactorily. Were it done by any one else it would be at the best but a copy of the statuary's conception.

The portrait completed, five or six pieces of wire must be pushed through the wax into the sand outline or core. It is now necessary to coat over the wax with liquid sand, applied most carefully with a fine hair brush. When a few coats of this sand have been made to adhere to the wax, the statuette is surrounded by an iron frame, and the frame is filled up with sand mixture. The frame is generally about twice the size of the statue. When all is ready, this frame is removed with its contents to a warm place, so that the water may evaporate from the sand and the latter gradually consolidate. Holes must then be cut at one end through the outer sand casing to the wax, after which the frame is subjected to the baking process in a hot oven. The wax of course melts and runs out of the small perforation, leaving a space between the inner core, maintained in its position by the wires mentioned above, and the outer mould, which latter bears the faithful impression of the modelling bestowed on the wax. The holes through which the wax escaped are now used for the purpose of introducing the molten bronze. The metal poured in rapidly fills the space once occupied by the wax, and the work is done. When the metal has had time to cool, the artist anxiously breaks the sand casing away to disentomb his work. Sometimes a successful result rewards his pains, but the work is often a failure. The metal has not, perhaps, filled all the sharper and smaller crevices in the mould, or the presence of damp has impeded the process, or again, the escape of various gases has split the mould; and thus the whole work is in one moment destroyed, and must be commenced from the very first stage.

On the other hand, the method now pursued is more scientific, involves less risk, and is consequently less expensive, though it is still necessary to exercise the greatest skill and judgment. The sculptor need only produce his conception in plaster, and when this is finished hand it over to the founder, who can undertake the rest of the work without any assistance from the sculptor. The plaster model is forthwith imbedded in the sand contained in an iron frame or moulding-box. Thus safely laid out in a soft bed, the workman begins what is called piece-moulding. Taking a small section of the statue, he forces the sand, by striking it gently with a mallet, into every fissure and crevice, and thus obtains an accurate impression of that part of the model on which he has been working. Having completed one piece he proceeds with another, till, by putting the pieces together, he can cover that part of the statue which is exposed out of the sand-box. The model is then lifted from its bed, turned round, impressions taken of the other side, and when this is completed the model can be removed uninjured. The pieces of sections of the sand having the impressions of the model are fitted together in their relative seatings within the two halves of the mould-box. The mould being removed, we have, as it were, two sand inversions, one representing the right and the other the left side of the statue. The moulder then proceeds to make in the impress a core or fac-simile, only a little smaller in size, so that when this is placed within the mould there should remain all round a margin between the mould and the core equal to about $\frac{3}{16}$ inch in thickness. The core and the pieces which constitute

the mould being secured in their respective places, the whole is then exposed to the heat of an oven, so that the moisture may be removed and the sand hardened to receive the metal. Vents for the foul air and gas must also be provided, and runners to enable the metal to penetrate rapidly the margin between the core and outer mould after the bronze has thus been cast. The sculptor may, if he chooses, suggest any improvement to the chaser, who polishes and finishes off the casting. Owing to the intricacy and fineness of the model it sometimes requires a great number of pieces to make the mould, and several months' work to finish successfully even a group small enough to be placed upon a mantelpiece. One of the great advantages of this new process is the fact that if the casting fails the artist's chalk model, the result perhaps of infinite labor and of an inspiration which may never be repeated, remains unaltered. A new mould may be taken from it, and the second cast may prove a success. The statue can thus also be reproduced as often as desired; while with the old process the artist's work was carried away forever as the wax melted, and if the cast proved a failure there was no longer any record remaining of the work done and lost.

When the casting has been removed from the mould, which has to be broken to take the piece out, it is "pickled"—that is, washed in acid solution—to remove all the sand, grease, and other impurities which may still remain on the surface of the metal. It next passes into the hands of the "mounter," who fills up the plinth or stand, removes the superfluous metal which has run into the gates and vent-holes, and hands the piece, thus trimmed, to the "chaser."

This workman "goes over" the surface of the piece, removing the defects or inaccuracies which may have occurred in the moulding, and finishes the surface according to the style desired by the manufacturer. The amount of labor or talent that a chaser may put on a piece is nearly unlimited. The style of finish usually found on bronze statuettes is the "plain" finish; the workman has simply scraped down slightly but evenly the surface of the metal. A more elaborate style is the "ridource" or cross-riffled. Here the surface is covered with slight lines intersecting each other at different angles like the "cross-hatchings" in line engravings. Still another finish is termed "chairé" or "skin-finish," and imitates the grain of the skin with innumerable small marks made with a flat tool or punch. In imitating different stuffs the texture is often reproduced, and the price of a bronze figure may vary from 50 to 75 per cent on account of extra chasing.

An important aid to the chaser is the "ragrésur," who fills up the defects or crevices which often occur in castings by drilling holes, tapping or cutting a screw thread in them, and filling them with a rivet or plug, the head of which is hammered down and so incorporated into the body of the metal as to make all trace of it imperceptible. For figures to be gilt or silvered, all the joints of figures made of separate pieces have to be soldered with hard solder, but when the pieces are simply to be bronzed, "cold mounting" is sufficient. To do this a rim of metal has been left in excess on all the extremities that are to be united, and when the pieces are well secured together by screws, pins or bolts, this metal is hammered into the crack left by the joint and the surplus filed or cut away, thus completely obliterating every trace of the spot where the pieces have been united.

The different colors given to bronzes are produced by chemical action. In doing this the manufacturer only assists nature; for the different tints are those which the metal would naturally acquire under different atmospheric influences. Thus, a bronze left in a dry, temperate atmosphere would in time acquire the brown tint known as "bronze color." If the atmosphere were damp it would be covered with verdigris; so the manufacturer, by using vinegar and other acids, accelerates the work of nature, and in a few hours makes a green bronze similar to that which it would take many years to obtain by natural effects.

The "brass" so fashionable now is a mixture of copper and zinc, and is susceptible of attaining a high polish. It was much used in the time of Louis XIII. of France and originally made in Flanders. Many pieces now struck up with dies are reproductions of old pieces in hammered or "repoussé" work. With the present style of furniture, a judicious selection of bronze or brass, relieved by a few brilliant pieces of earthenware, adds very much to the pleasant effect of the decoration of a room. CURIO.

ART IN PIANO MANUFACTURE.

IN the present revival of art in its application to household furniture, there is no article to which so little attention has been paid as the piano, although it is one of the most conspicuous in the modern house. The clumsy and unshapely cases, which are as old as the days of our grandfathers, are still in common use, and, by their obtrusive, uncompromising presence, often destroy what but for them might be an artistically appointed room. That there is no necessity for this conservativeness on the part of our American piano-makers is evident from the success with which the English house of Broadwood & Sons have made an innovation in the opposite direction.

This firm has made for Mr. Alma Tadema, the artist, a very beautiful instrument after the design and drawings of Mr. G. E. Fox, an architect, who is engaged in restoring the internal decorations of Warwick Castle. The room in which the pianoforte stands is in the Byzantine style, with gold walls and ceiling. The usual form of the grand piano has been preserved, but the supports are more substantial and of an architectural character, the columns being alternately of rosewood and ebony, while the instrument case and cover is of oak. The very large masses of fine ivory employed in the carved acanthus ornament of the sides of the keyboard and about the seats first attract the eye, and this material is carried round the frieze of the case in tear-drops, a suggestion from St. Sophia, at Constantinople. The sides of the case are panelled, and the curved side bears in addition devices representing the lark, owl, and cuckoo, with their characteristic notes in old musical notation. Initials of Mr. Alma Tadema have also been frequently and tastefully used in the ornamentation. The top is adorned with geometrical patterns, in mahogany, white woods, ebony, tortoise-shell, and mother-of-pearl. Inside the piano, the iron framing, plate, and tension bars are painted with a beautiful pattern. The old harpsichords had frequently paintings, sometimes by eminent masters, on the under side of the top, shown when that covering was raised for performance. Mr. Tadema has had sheets of vellum framed to enhance the musical value of the instrument by the approving signatures of his musical friends who have played upon or in concert with it. Behind a satin curtain with rare gold embroideries a Byzantine window has recently been constructed, which lights piano and room through beautiful glazings of Mexican onyx. Whichever of our first-class American piano-makers will turn out from his factory such a work of art in this country will certainly reap a rich reward for his enterprise.

DESIGN IN CARPETS.

ON the placard defining principles of decorative art hanging at the school at South Kensington, London, are the following rules in regard to carpets: 1. The surface of a carpet, serving as a ground to support all objects, should be quiet and negative, without strong contrast of either forms or colors. 2. The leading forms should be so disposed as to distribute the pattern over the whole floor, not pronounced either in the direction of breadth or length, all "up and down" treatment being erroneous. 3. The decorative forms should be flat, without shadow or relief, whether derived from ornament or direct from flowers or foliage. 4. In color the general ground should be negative, low in tone, and inclining to the tertiary hues, the leading forms of the pattern being expressed by the darker secondaries; and the primary colors, or white, if used at all, should be only in such quantity as to enhance the tertiary hues, and to express the geometrical basis that rules the distribution of the forms.

ART NEEDLEWORK AND THE CHURCH.

THE following suggestive lines are from Ave Maria, a Catholic magazine of large circulation in the West: "We have not seen a more dainty set of illustrated pages than those of THE ART AMATEUR. The illustrations are wonderfully clear and delicate, indicating a purpose beyond mere *effect*—a word which covers all sorts of artistic sins in the way of blots, coarse and careless work. The text of usefulness is kept to in the letter-press; and while it pretends to deal only with every-day affairs, needles and crewels, or decorative painting on silk or on wood, or whatever the material may be, it puts into the hands of any lady the ways and means of doing such work as used to occupy queens and noble ladies, abbesses and nuns, in the ages when work for the sanctuary was esteemed privileged work. Some Protestant lady said the other day, when looking at the marvellous embroidery on napkins and toilet linens, 'I should think the Catholic Church would take this up.' The lady put it rather broadly, but what she meant was, 'I should think Catholic ladies would seize upon all these decorative hints for their altars and sanctuaries.' We could say that in those ages when the culture of the world was on the side of the Catholic Church, the very stitches which are now used to adorn the luxurious bath-rooms or boudoirs of the rich were used for altar-cloths, purifiers, vestments, sanctuary furniture. Long before the Decorative Art Societies were thought of, these tricks of the needle were found out by pious ladies, and used in the service of God. The hand, not the loom, in those days fashioned the cope, the chasuble, the stole; and in so doing won merits which served them in the great Day of account. Our Catholic young ladies have as much leisure as any young ladies we know; our Catholic households keep as many domestics; and for this leisure they will be called to answer. The matter of industries is not a light one; it has to do with Catholic piety as well as with good domestic habits. At this day it will not do to make monstrosities in chenille work when one can *paint* in crewels; nor will stuffed dogs' heads be acceptable in zephyr, when an *etching* in silk on fine linen has all the effect of a pencil sketch. A whole *art education* lies behind this needlework—an art education such as we rejoice to know is given in more than one convent school. The result must be to put hand instead of loom work into American sanctuaries and American sacristy closets."

Among the Dealers.

OUR leading New York firms who deal in paintings, fine bronzes, faience, and other art merchandise, have all been represented abroad this summer by members of their respective houses, who have lately returned with packing-cases innumerable, containing, perhaps, the choicest selection of goods ever brought to this country. This we may venture to say simply on what we have seen in a few instances, for most of the goods are yet unpacked. On another page we dwell at length on important new foreign pictures that have been brought over.

If an ingenious cabinet-maker could manage to introduce into ebonized furniture some of the brilliant blue tropical butterflies such as Mr. Solomon, the Broadway jeweller, exhibits in his windows, some beautiful effects might be produced. As, of course, they would have to be under glass, they would be best introduced in cabinet panels or screens. This dealer is an enthusiastic naturalist, and during his business travels through South America he has got together some extremely rare specimens of tropical butterflies and birds, some of which would be better in a museum than on the persons of the fashionable ladies who buy them. Mr. Solomon has brought home with him, among other beautiful trifles, a few sprays of wonderful artificial feather flowers, made by the Indians. He took all that he could induce them to make for him. If he can ever find his way to their village again, of which he has some doubt, he means to keep them permanently busy for the American market.

Among the faience and porcelain importations by Messrs. Schneider, Campbell & Co. are some splendid pieces of Daubron Frères, who are masters in Japanese decoration. Some of the vases are very clever imitations of cloisonné. Delforge is also represented by some good work in this direction. Ernie has followed in the line of the prevailing Japanese fashion, but with strikingly original treatment of his subjects. Two vases painted by Bellanger are very beautiful. Mr. Schneider, who himself selected all the new goods, has been fortunate in choosing his examples of Haviland ware. There are some flower pieces painted by Léon Parisot in his best style, and Edward Dammousse, who has gone extensively into figure painting, is represented by some admirable flat-sided vases with the most decorative effects. Most of the bronzes Mr. Schneider has brought from Paris have at the present writing not been unpacked, although some have been sold already, among others being a large "frotte d'or" copy of Mercié's "David after the Combat," one of the masterpieces from Barbedienne's workshop. It may be remarked here, "en passant," that the face of David is modelled from that of a woman, whose features Mercié has perhaps made somewhat too familiar to us. One cannot help noticing in this statue, by the way, that the sword of Goliath which young David is sheathing is a boy's sword, quite out of proportion to the giant himself, of whose immense size we are forcibly reminded from the fact that David has one foot on his dissevered head. "The Genius of Franklin" and "The Youth of Columbus" are a charming pair of bronzes by Montevarde. The original of the latter work, if we are not mistaken, was in the Athenæum at Boston. Among other bronzes we noticed is a truly charming "Perseus and Andromeda," by Gregoire; "The Falconer," by C. L. Brunin, and a very graceful half-draped female figure, whose title we do not recall, by Allegrin.